Scenarios for the National Climate Assessment

NCA Scenarios Working Group

Why Use Scenarios?

Not to "predict" but to analyze uncertainties and strategies that are robust with respect to a range of futures.

Scenarios can:

- **Provide consistent inputs to modeling and analysis;**

- **Provide a basis for comparing "business as usual" and various policy futures;**

- **Inform decisions; and**

- **Communicate.**

Scenarios are best developed for specific applications.

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Planning Process (status as of August 2011)

- **A December 2010 workshop provided foundation.**

- **A NCADAC ad hoc working group developed recommendations.**

- **The NCADAC decided to use scenarios and made preliminary decisions in late May:**

  - **Four types of scenarios: climate, sea level, land use, and socioeconomic as well as,**

  - **An innovative scenario planning process in pilot studies.**

- **The INCA Task Force was asked for input.**

- **Implementation is under way:**

  - **Balancing "art of the possible," needs for coordination, and building resources for an ongoing process.**

Climate

- **Ken Kunkel, NOAA National Climate Data Center, is leading the development of climate data and information:**

  - **Climatologies for each NCA Region,**

  - **Projections corresponding to IPCC SRES A2 (high) and B1 (low) emissions scenarios as minimum set,**

  - **Down-scaled data (both statistical and dynamical), screened using agreed upon criteria, and**

  - **Regional outlooks using a common set of technical guidelines.**

- **Whether to associate probabilities with climate projections is a pending issue.**

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Regional Climatology Content

- **General Description**
  - **Maps of spatial patterns of mean annual temperature and precipitation**

- **Major Climate Factors**
  - **e.g., drought, heat waves, winter storms, flash floods**

- **Trends**
  - **Seasonal and annual temperature and precipitation**
  - **Precipitation extremes (daily 5 year storms)**
  - **Temperature extremes (4 day, 1 in 5 year events)**
 - **Freeze-free season length**

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- **Data Sets**
  - **Global climate model results as used for 2009 report (A2 and B1)**
  - **Maurer et al. statistically downscaled monthly data**
  - **Daily version of Maurer et al. data produced by Katharine Hayhoe**
 - **North American Regional Climate Change Assessment Program (NARCCAP) results**
- **Status**
  - **Drafts in preparation**
  - **Review through regional workshops and expert groups**
  - **Southwest Region Workshop, August 1–4, 2011**

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Southwest Regional Climate

- **Maps of mean annual temperature and precipitation.**
- **Major climatic factors, e.g., drought, heat waves, winter storms, flash floods.**
- **Trends:**
  - Seasonal and annual temperature and precipitation;
  - Precipitation extremes (daily 5 year storms);
  - Temperature extremes (4 day, 1 in 5 year events); and
  - Freeze-free season length.
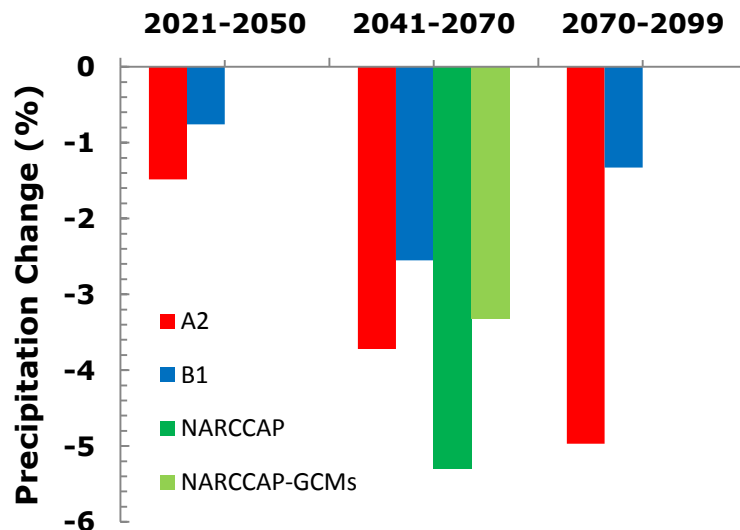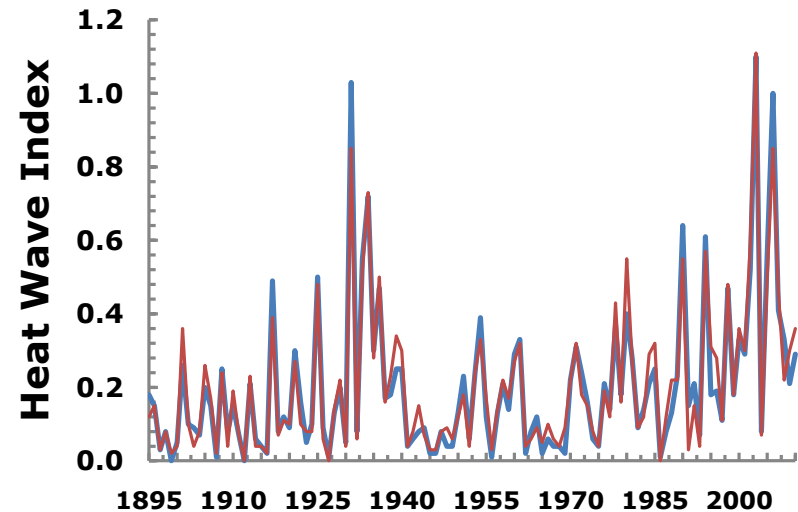
NARCCAP, Change in Annual Precipitation 2041-2070 minus 1971-2000
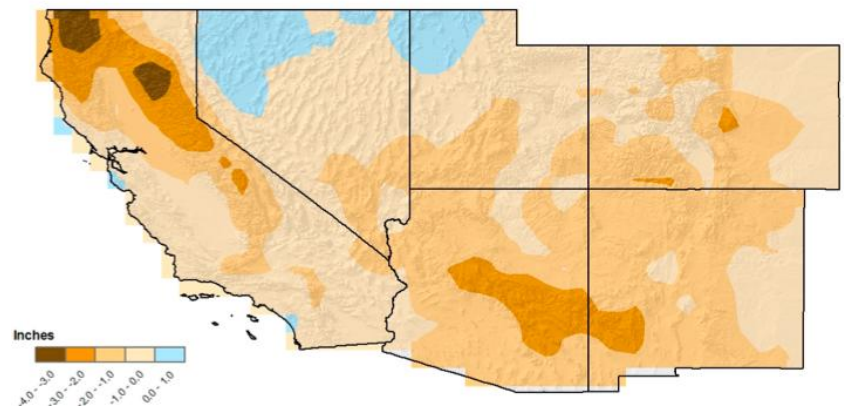
Sea Level Change

- **Provide a four to five page summary document and accompanying table containing, at a minimum, a range of estimates for global mean sea level rise.**

- **Provide a brief description of sea level anomalies for one or two sample regions, accompanied by tables, figures, and a template for compiling estimates of sea level change provided by regional and sectoral teams.**

- **Provide guidance on the choice of climate information for analyzing potential changes in the frequency and severity of extreme sea level events and factors in addition to global sea level rise that affect coastal exposure.**

- **Status**
  - **Sea level scenarios workshop, August 4, 2011**

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Sea Level Change – August 2011 Workshop

- **Global Mean Sea Level Rise – Year 2100**
  - **Curves fit to 1992 reference point and year 2100 end points.**
  - **High: 2.0 m (Pfeffer *et al.* 2008)**
  - **Intermediate 1: 1.4 m**
    - Average of semi-empirical studies consistent with SRES scenario A2 at 95% confidence.
  - **Intermediate 2: 0.7 m**
    - Average of semi-empirical studies consistent with SRES scenario B1 at 5% confidence.
  - **Low**
    - Extrapolation of observed historic rate.
    - At 2100, similar to results under B1 at 5% confidence.

- **Regional Inter-Annual Variability**
  - **Case studies will characterize differences apparent in observed historical tide data and satellite altimetry.**

- **Revise Scenario in early 2012 to incorporate National Research Council's West Coast study and have NRC panelists review the NCA scenario.**

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Land Cover and Land Use

- **No recommendations or decisions have yet been reached.**

- **Survey of existing resources and activities to engage relevant agencies are underway.**

- **Encourage consistency with SRES A2 and B1.**

- **Long term: produce different kinds of projections of land cover and land use (e.g., potential natural vegetation, changes in existing species distributions, changes in land-use as a function of carbon and food demands, etc.) organized on regional basis.**

Socioeconomic Scenarios

- **Characterize historical trends and current conditions (1981–2010) using data from U.S. Government statistical agencies.**

  - **State, regional, and national**

- **Provide regional and national projections from U.S. Government sources to ~2035.**

- **Provide long-term national projections to 2100.**

- **Status:**

  - **Bureau of Census is compiling data.**

Participatory Scenario Planning

- **Survey existing work in regions and sectors, considering scope, time periods, methods, and implementation issues.**

- **Incorporate results of case studies into relevant regional or sectoral chapters.**

- **Encourage a small number of pilot scenario planning activities in the regional and sectoral engagement processes focused on adaptation.**

- **Evaluate "lessons learned" and prepare a short assessment of needs and opportunities for future assessments that will be included in the 2013 report.**

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